SEQUENCE LISTING

<110> National Institute of Advanced Industrial Science and Technology

<120> Lethal gene markers for transformant selection

<130> -23603055

<140>

<141>

<160> 24

<170> PatentIn Ver. 2.1

<210> 1

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 1

gctgatgctg cattgagttc tgctatgg 28

<210> 2

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 2

gttaaatcca atttaagtcc cataacttgg ccgctatggc ctcaaagata tttcttg 57

<210> 3

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 3

caagaaatat ctttgaggcc atagcggcca agttatggga cttaaattgg atttaac 57

<210> 4

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 4

tcatccctga taatatttga tcaccaat 28

<210> 5

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 5

gcatggccgc ctcggccgaa aggttttaaa gattacgggc atg 43

<210> 6

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 6

cgatgaattc tcaccaatca ccatcacgat aatc 34

<210> 7

<211> 598

<212> DNA

<213> E.coli

<400> 7

gcatggccgc ctcggccgaa aggttttaaa gattacgggc atgattatca tccagctccg 60
aaaactgaga atattaaagg gcttggtgat cttaagcctg ggataccaaa aacaccaaag 120
cagaatggtg gtggaaaacg caagcgctgg actggagata aagggcgtaa gatttatgag 180
tgggattctc agcatggtga gcttgagggg tatcgtgcca gtgatggtca gcatcttggc 240
tcatttgacc ctaaaacagg caatcagttg aaaggtccag atccgaaacg aaatatcaag 300
aaatatcttt gaggccatag cggccaagtt atgggactta aattggattt aacttggttt 360
gataaaagta cagaagattt taagggtgag gagtattcaa aagattttgg agatgacggt 420
tcagttatgg aaagtctagg tgtgcctttt aaggataatg ttaataacgg ttgctttgat 480
gttatagctg aatgggtacc tttgctacaa ccatacttta atcatcaaat tgatatttcc 540
gataatgagt attttgtttc gtttgattat cgtgatggtg attggtgaga attcatcg 598

<210> 8

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 8

tagtagtagt agtagaaagg ttttaaagat tacgggcatg 40

<210> 9

<211> 46

<212> DNA

<213> E.coli

<400> 9

gcatggccgc ctcggccgta gaaaggtttt aaagattacg ggcatg 46

<210> 10

<211> 49

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 10

gcatggccgc ctcggccgta gtagaaaggt tttaaagatt acgggcatg 49

<210> 11

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 11

gcatggccgc ctcggccgta gtagtagaaa ggttttaaag attacgggca tg 52

<210> 12

<211> 55

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 12

gcatggccgc ctcggccgta gtagtagtag aaaggtttta aagattacgg gcatg 55

<210> 13

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 13

gcatggccgc ctcggccgta gtagtagtag tagaaaggtt ttaaagatta cgggcatg 58

<210> 14

<211> 607

<212> DNA

<213> E.coli

<400> 14

gcatggccgc ctcggccgta gtagtagaaa ggttttaaag attacgggca tgattatcat 60

ccagctccga aaactgagaa tattaaaggg cttggtgatc ttaagcctgg gataccaaaa 120

acaccaaagc agaatggtgg tggaaaacgc aagcgctgga ctggagataa agggcgtaag 180

atttatgagt gggattctca gcatggtgag cttgaggggt atcgtgccag tgatggtcag 240

catcttggct catttgaccc taaaacaggc aatcagttga aaggtccaga tccgaaacga 300

aatatcaaga aatatctttg aggccatagc ggccaagtta tgggacttaa attggattta 360

acttggtttg ataaaagtac agaagatttt aagggtgagg agtattcaaa agattttgga 420

gatgacggtt cagttatgga aagtctaggt gtgcctttta aggataatgt taataacggt 480

tgctttgatg ttatagctga atgggtacct ttgctacaac catactttaa tcatcaaatt 540

gatatttccg ataatgagta ttttgtttcg tttgattatc gtgatggtga ttggtgagaa 600
ttcatcg 607

<210> 15
<211> 258
<212> DNA
<213> E.coli

<400> 15
atgggactta aattggattt aacttggttt gataaaagta cagaagattt taagggtgag 60
gagtattcaa aagattttgg agatgacggt tcagttatgg aaagtctagg tgtgcctttt 120
aaggataatg ttaataacgg ttgctttgat gttatagctg aatgggtacc tttgctacaa 180
ccatacttta atcatcaaat tgatatttcc gataatgagt attttgtttc gtttgattat 240
cgtgatggtg attggtga 258

<210> 16
<211> 3066
<212> DNA
<213> E.coli

<400> 16
aactcggttt taatcagacc tggcatgagt ggaagcggga cgaacagcac aggcaacaac 60
aacgccgccc cgggcacttc cggggcatga gtatgtgata tccggggctg caccccggac 120
cccgccaaca catcacgggc cacaaaattt tttgtggccc gctctgcgtt ttctaagtgt 180
tatccctcct gatttctaaa aaattttcca cctgaacttg acagaaaaaa cgatgacgag 240

tacttttga tctgtacata aacccagtgg ttttatgtac agtattaatc gtgtaatcaa 300
ttgttttaac gcttaaaaga gggaattttt atgagcggtg gcgatggacg cggccataac 360
acgggcgcgc atagcacaag tggtaacatt aatggtggcc cgaccgggct tggtgtaggt 420
ggtggtgctt ctgatggctc cggatggagt tcggaaaata acccgtgggg tggtggttcc 480
ggtagcggca ttcactgggg tggtggttcc ggtcatggta atggcggggg gaatggtaat 540
tccggtggtg gttcgggaac aggcggtaat ctgtcagcag tagctgcgcc agtggcattt 600
ggttttccgg cactttccac tccaggagct ggcggtctgg cggtcagtat ttcagcggga 660
gcattatcgg cagctattgc tgatattatg gctgccctga aaggaccgtt taaatttggt 720
ctttgggggg tggctttata tggtgtattg ccatcacaaa tagcgaaaga tgaccccaat 780
atgatgtcaa agattgtgac gtcattaccc gcagatgata ttactgaatc acctgtcagt 840
tcattacctc tcgataaggc aacagtaaac gtaaatgttc gtgttgttga tgatgtaaaa 900
gacgagcgac agaatatttc ggttgtttca ggtgttccga tgagtgttcc ggtggttgat 960
gcaaaaccta ccgaacgtcc gggtgttttt acggcatcaa ttccaggtgc acctgttctg 1020
aatatttcag ttaataacag tacgccagca gtacagacat taagcccagg tgttacaaat 1080
aatactgata aggatgttcg cccggcagga tttactcagg gtggtaatac cagggatgca 1140
gttattcgat tcccgaagga cagcggtcat aatgccgtat atgtttcagt gagtgatgtt 1200
cttagccctg accaggtaaa acaacgtcaa gatgaagaaa atcgccgtca gcaggaatgg 1260
gatgctacgc atccggttga agcggctgag cgaaattatg aacgcgcgcg tgcagagctg 1320
aatcaggcaa atgaagatgt tgccagaaat caggagcgac aggctaaagc tgttcaggtt 1380
tataattcgc gtaaaagcga acttgatgca gcgaataaaa ctcttgctga tgcaatagct 1440
gaaataaaac aatttaatcg atttgcccat gacccaatgg ctggcggtca cagaatgtgg 1500
caaatggccg ggcttaaagc ccagcgggcg cagacggatg taaataataa gcaggctgca 1560
tttgatgctg ctgcaaaaga gaagtcagat gctgatgctg cattgagttc tgctatggaa 1620
agcaggaaga agaaagaaga taagaaaagg agtgctgaaa ataatttaaa cgatgaaaag 1680
aataagccca gaaaaggttt taaagattac gggcatgatt atcatccagc tccgaaaact 1740
gagaatatta aagggcttgg tgatcttaag cctgggatac caaaaacacc aaagcagaat 1800
ggtggtggaa aacgcaagcg ctggactgga gataaagggc gtaagattta tgagtgggat 1860

tctcagcatg gtgagcttga ggggtatcgt gccagtgatg gtcagcatct tggctcattt 1920
gaccctaaaa caggcaatca gttgaaaggt ccagatccga aacgaaatat caagaaatat 1980
ctttgagagg aagttatggg acttaaattg gatttaactt ggtttgataa aagtacagaa 2040
gattttaagg gtgaggagta ttcaaaagat tttggagatg acggttcagt tatggaaagt 2100
ctaggtgtgc cttttaagga taatgttaat aacggttgct ttgatgttat agctgaatgg 2160
gtacctttgc tacaaccata ctttaatcat caaattgata tttccgataa tgagtatttt 2220
gtttcgtttg attatcgtga tggtgattgg tgatcaaata ttatcaggga tgagttgata 2280
tacgggcttc tagtgttcat ggatgaacgc tggagcctcc aaatgtagaa atgttatatt 2340
ttttattgag ttcttggtta taattgctcc gcaatgattt aaataagcat tatttaaaac 2400
attctcagga gaggtgaagg tggagctaaa aaaaagtatt ggtgattaca ctgaaaccga 2460
attcaaaaaa tttattgaag acatcatcaa ttgtgaaggt gatgaaaaaa aacaggatga 2520
taacctcgag tattttataa atgttactga gcatcctagt ggttctgatc tgatttatta 2580
cccagaaggt aataatgatg gtagccctga aggtgttatt aaagagatta aagaatggcg 2640
agccgctaac ggtaagtcag gatttaaaca gggctgaaat atgaatgccg gttgtttatg 2700
gatgaatggc tggcattctt tcacaacaag gagtcgttat gaaaaaaata acagggatta 2760
ttttattgct tcttgcagtc attattctgt ctgcatgtca ggcaaactat atccgggatg 2820
ttcagggcgg gaccgtatct ccgtcatcaa cagctgaagt gaccggatta gcaacgcagt 2880
aacccgaaat cctctttgac aaaaacaaag cgtgtcaggc tgattctgat gcgctttttt 2940
tttgaaatgt cacaaaaatt ccatgtggga gatgggatct aaaatcctcg tgcagaactt 3000
tccatccagg gggagaaaac ttgtcgtttt gagccgttcg gtgttcagaa cgcacgaaac 3060
cgatcg 3066

<210> 17

<211> 551

<212> PRT

<213> E.coli

<400> 17

Met Ser Gly Gly Asp Gly Arg Gly His Asn Thr Gly Ala His Ser Thr
1 5 10 15

Ser Gly Asn Ile Asn Gly Gly Pro Thr Gly Leu Gly Val Gly Gly Gly
20 25 30

Ala Ser Asp Gly Ser Gly Trp Ser Ser Glu Asn Asn Pro Trp Gly Gly
35 40 45

Gly Ser Gly Ser Gly Ile His Trp Gly Gly Gly Ser Gly His Gly Asn
50 55 60

Gly Gly Gly Asn Gly Asn Ser Gly Gly Gly Ser Gly Thr Gly Gly Asn
65 70 75 80

Leu Ser Ala Val Ala Ala Pro Val Ala Phe Gly Phe Pro Ala Leu Ser
85 90 95

Thr Pro Gly Ala Gly Gly Leu Ala Val Ser Ile Ser Ala Gly Ala Leu
100 105 110

Ser Ala Ala Ile Ala Asp Ile Met Ala Ala Leu Lys Gly Pro Phe Lys
115 120 125

Phe Gly Leu Trp Gly Val Ala Leu Tyr Gly Val Leu Pro Ser Gln Ile

130 135 140

Ala Lys Asp Asp Pro Asn Met Met Ser Lys Ile Val Thr Ser Leu Pro
145 150 155 160

Ala Asp Asp Ile Thr Glu Ser Pro Val Ser Ser Leu Pro Leu Asp Lys
165 170 175

Ala Thr Val Asn Val Asn Val Arg Val Val Asp Asp Val Lys Asp Glu
180 185 190

Arg Gln Asn Ile Ser Val Val Ser Gly Val Pro Met Ser Val Pro Val
195 200 205

Val Asp Ala Lys Pro Thr Glu Arg Pro Gly Val Phe Thr Ala Ser Ile
210 215 220

Pro Gly Ala Pro Val Leu Asn Ile Ser Val Asn Asn Ser Thr Pro Ala
225 230 235 240

Val Gln Thr Leu Ser Pro Gly Val Thr Asn Asn Thr Asp Lys Asp Val
245 250 255

Arg Pro Ala Gly Phe Thr Gln Gly Gly Asn Thr Arg Asp Ala Val Ile
260 265 270

Arg Phe Pro Lys Asp Ser Gly His Asn Ala Val Tyr Val Ser Val Ser

275 280 285

Asp Val Leu Ser Pro Asp Gln Val Lys Gln Arg Gln Asp Glu Glu Asn
290 295 300

Arg Arg Gln Gln Glu Trp Asp Ala Thr His Pro Val Glu Ala Ala Glu
305 310 315 320

Arg Asn Tyr Glu Arg Ala Arg Ala Glu Leu Asn Gln Ala Asn Glu Asp
325 330 335

Val Ala Arg Asn Gln Glu Arg Gln Ala Lys Ala Val Gln Val Tyr Asn
340 345 350

Ser Arg Lys Ser Glu Leu Asp Ala Ala Asn Lys Thr Leu Ala Asp Ala
355 360 365

Ile Ala Glu Ile Lys Gln Phe Asn Arg Phe Ala His Asp Pro Met Ala
370 375 380

Gly Gly His Arg Met Trp Gln Met Ala Gly Leu Lys Ala Gln Arg Ala
385 390 395 400

Gln Thr Asp Val Asn Asn Lys Gln Ala Ala Phe Asp Ala Ala Ala Lys
405 410 415

Glu Lys Ser Asp Ala Asp Ala Ala Leu Ser Ser Ala Met Glu Ser Arg

420 425 430

Lys Lys Lys Glu Asp Lys Lys Arg Ser Ala Glu Asn Asn Leu Asn Asp
435 440 445

Glu Lys Asn Lys Pro Arg Lys Gly Phe Lys Asp Tyr Gly His Asp Tyr
450 455 460

His Pro Ala Pro Lys Thr Glu Asn Ile Lys Gly Leu Gly Asp Leu Lys
465 470 475 480

Pro Gly Ile Pro Lys Thr Pro Lys Gln Asn Gly Gly Gly Lys Arg Lys
485 490 495

Arg Trp Thr Gly Asp Lys Gly Arg Lys Ile Tyr Glu Trp Asp Ser Gln
500 505 510

His Gly Glu Leu Glu Gly Tyr Arg Ala Ser Asp Gly Gln His Leu Gly
515 520 525

Ser Phe Asp Pro Lys Thr Gly Asn Gln Leu Lys Gly Pro Asp Pro Lys
530 535 540

Arg Asn Ile Lys Lys Tyr Leu
545 550

<210> 18

<211> 110

<212> PRT

<213> E.coli

<400> 18

Ala Glu Asn Asn Leu Asn Asp Glu Lys Asn Lys Pro Arg Lys Gly Phe
1 5 10 15

Lys Asp Tyr Gly His Asp Tyr His Pro Ala Pro Lys Thr Glu Asn Ile
20 25 30

Lys Gly Leu Gly Asp Leu Lys Pro Gly Ile Pro Lys Thr Pro Lys Gln
35 40 45

Asn Gly Gly Gly Lys Arg Lys Arg Trp Thr Gly Asp Lys Gly Arg Lys
50 55 60

Ile Tyr Glu Trp Asp Ser Gln His Gly Glu Leu Glu Gly Tyr Arg Ala
65 70 75 80

Ser Asp Gly Gln His Leu Gly Ser Phe Asp Pro Lys Thr Gly Asn Gln
85 90 95

Leu Lys Gly Pro Asp Pro Lys Arg Asn Ile Lys Lys Tyr Leu
100 105 110

<210> 19

<211> 97

<212> PRT

<213> E.coli

<400> 19

Lys Gly Phe Lys Asp Tyr Gly His Asp Tyr His Pro Ala Pro Lys Thr
1 5 10 15

Glu Asn Ile Lys Gly Leu Gly Asp Leu Lys Pro Gly Ile Pro Lys Thr
20 25 30

Pro Lys Gln Asn Gly Gly Gly Lys Arg Lys Arg Trp Thr Gly Asp Lys
35 40 45

Gly Arg Lys Ile Tyr Glu Trp Asp Ser Gln His Gly Glu Leu Glu Gly
50 55 60

Tyr Arg Ala Ser Asp Gly Gln His Leu Gly Ser Phe Asp Pro Lys Thr
65 70 75 80

Gly Asn Gln Leu Lys Gly Pro Asp Pro Lys Arg Asn Ile Lys Lys Tyr
85 90 95

Leu

<210> 20

<211> 330

<212> DNA

<213> E.coli

<400> 1

ggccgcctcg gccgtagtag tagaaaggtt ttaaagatta cgggcatgat tatcatccag 60

ctccgaaaac tgagaatatt aaagggcttg gtgatcttaa gcctgggata ccaaaaacac 120

caaagcagaa tggtggtgga aaacgcaagc gctggactgg agataaaggg cgtaagattt 180

atgagtggga ttctcagcat ggtgagcttg aggggtatcg tgccagtgat ggtcagcatc 240

ttggctcatt tgaccctaaa acaggcaatc agttgaaagg tccagatccg aaacgaaata 300

tcaagaaata tctttgaggc catagcggcc 330

<210> 21

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:adapter

<400> 2

gatccccggg taccgaggcc gcctcggccg agctcgaatt cggccggcca tagcggccgc 60

<210> 22

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:adapter

<400> 3

aattgcggcc gctatggccg gccgaattcg agctcggccg aggcggcctc ggtacccggg 60

<210> 23

<211> 650

<212> DNA

<213> S.cerevisiae

<400> 4

ggccgcctcg gccaggatct ggtggcgaac aagcatgcga tatttgccga cttaaaaagc 60

tcaagtgctc caaagaaaaa ccgaagtgcg ccaagtgtct gaagaacaac tgggagtgtc 120

gctactctcc caaaaccaaa aggtctccgc tgactagggc acatctgaca gaagtggaat 180

caaggctaga aagactggaa cagctatttc tactgatttt tcctcgagaa gaccttgaca 240

tgattttgaa aatggattct ttacaggata taaaagcatt gttaacagga ttatttgtac 300

aagataatgt gaataaagat gccgtcacag atagattggc ttcagtggag actgatatgc 360

ctctaacatt gagacagcat agaataagtg cgacatcatc atcggaagag agtagtaaca 420

aaggtcaaag acagttgact gtatcgattg actcggcagc tcatcatgat aactccacaa 480

ttcgttgga ttttatgccc agggatgctc ttcatggatt tgattggtct gaagaggatg 540
acatgtcgga tggcttgccc ttcctgaaaa cggaccccaa caataatggg ttctttggcg 600
acggttctct cttatgtatt cttcgctgac tgactgaggc catagcggcc 650

<210> 24
<211> 535
<212> DNA
<213> A. oryzae

<400> 5
ggccgcctcg gccattacta gtctactagt aactctgtct tatcgtcatc tcccataggt 60
gagtttggtt gttttgtttc cactgagatc atgacctcct cctaccccac catcccacta 120
tttttgttac ggtagccatg acccctccat ggcaaagaga gaggaggacg aggacgatca 180
ggaaactgtg tctcgccgtc ataccacaat cgtgttatcc tgattgacat cttcttaaat 240
atcgttgtaa ctgttcctga ctctcggtca actgaaattg gatctcccca ccactgcctc 300
taccttgtac tccgtgactg aaccatccga tcattctttt tgggtcgtcg gtgaacacaa 360
cccccgctgc tagtctcctt ccaacaccga tccagaattg ttttgatttt ccattccctt 420
cgtttatatc tgtcgtctct cctccctttc cgtctctttt cttccgtcct ccaagttagt 480
cgactgacca attccgcagc tcgtcaaaat gcctatcacc aaggccatag cggcc 535